

### Consequences of Oxidative Agents Attacking Membranes

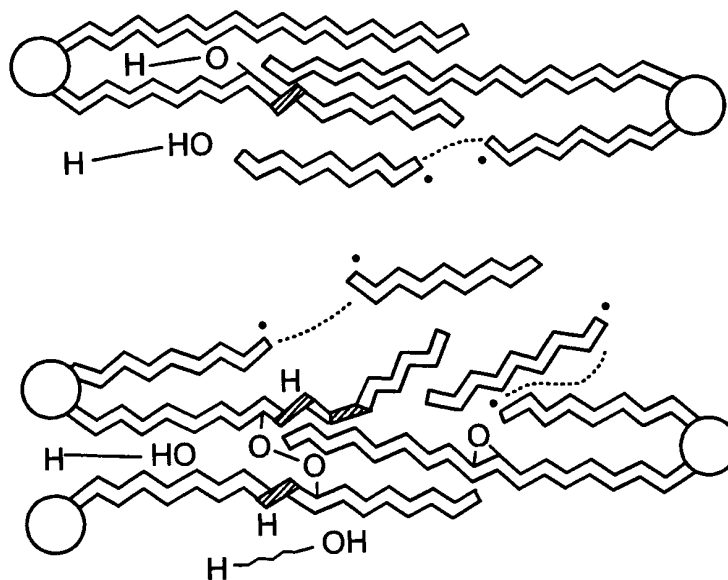


FIG. 1

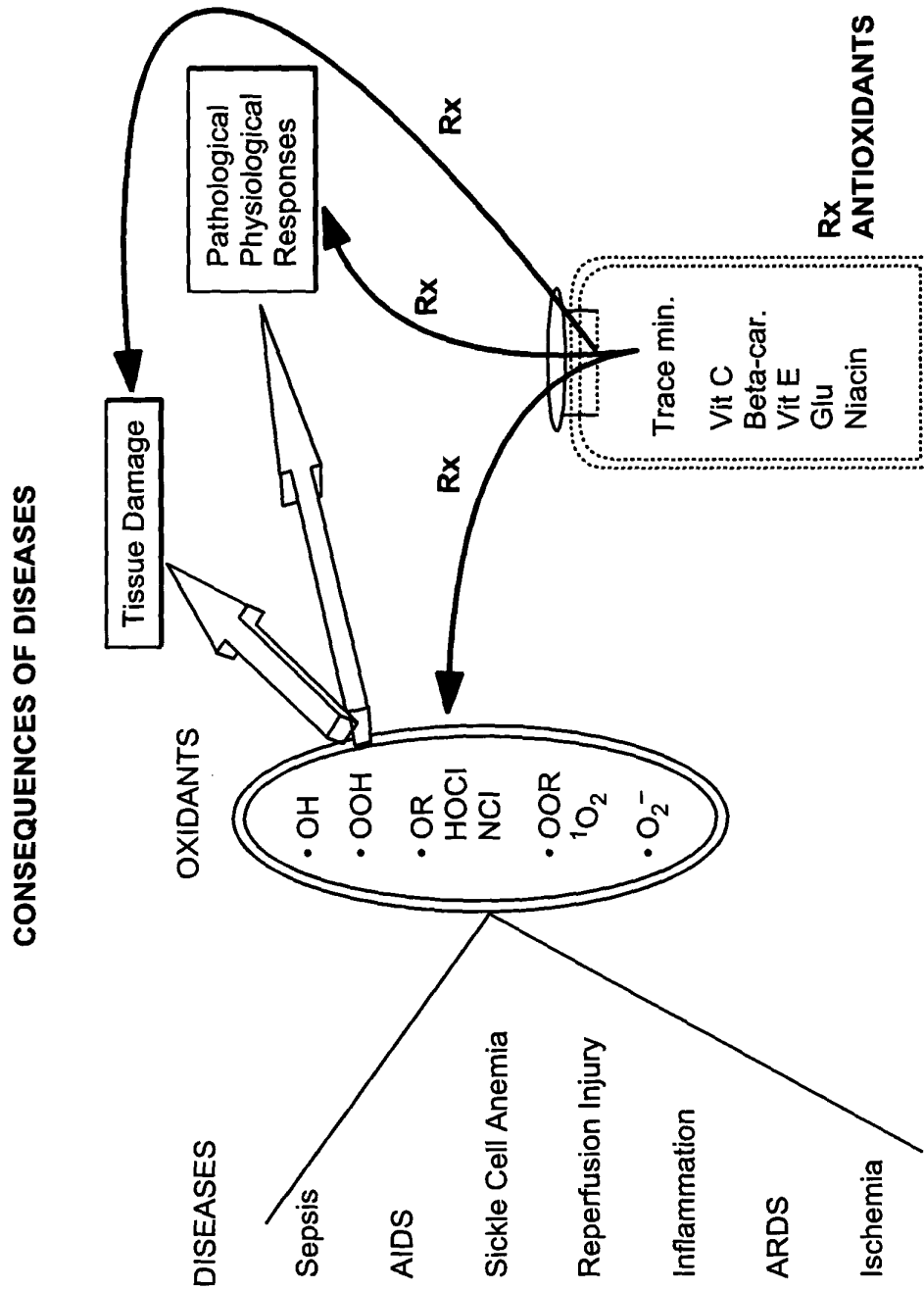
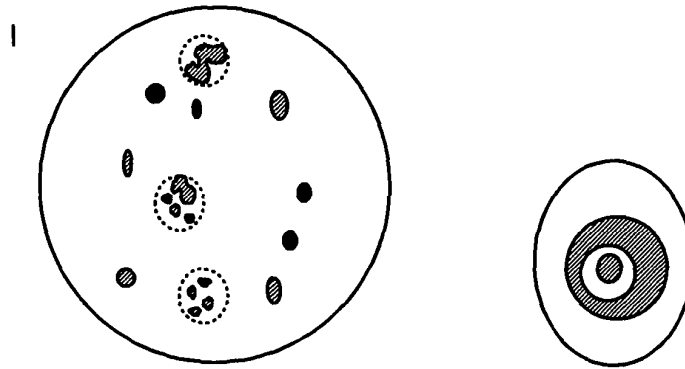
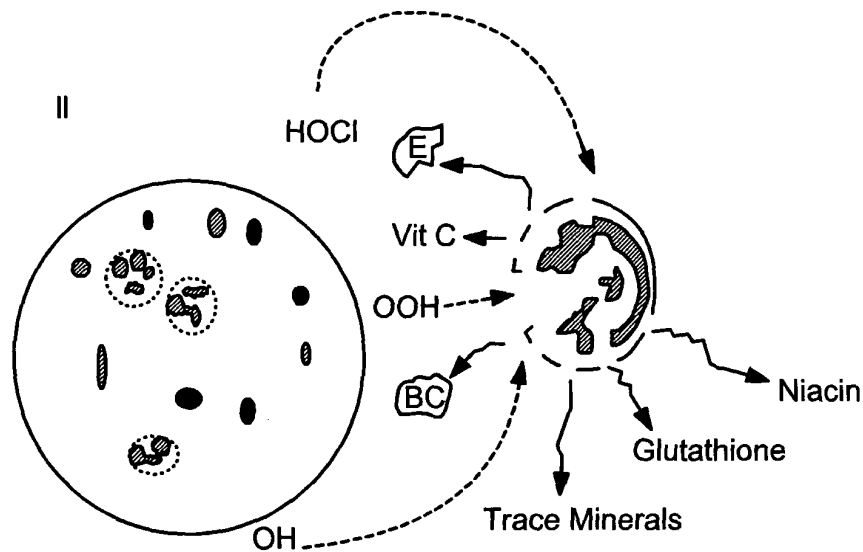


FIG. 2



No liberation of oxidants

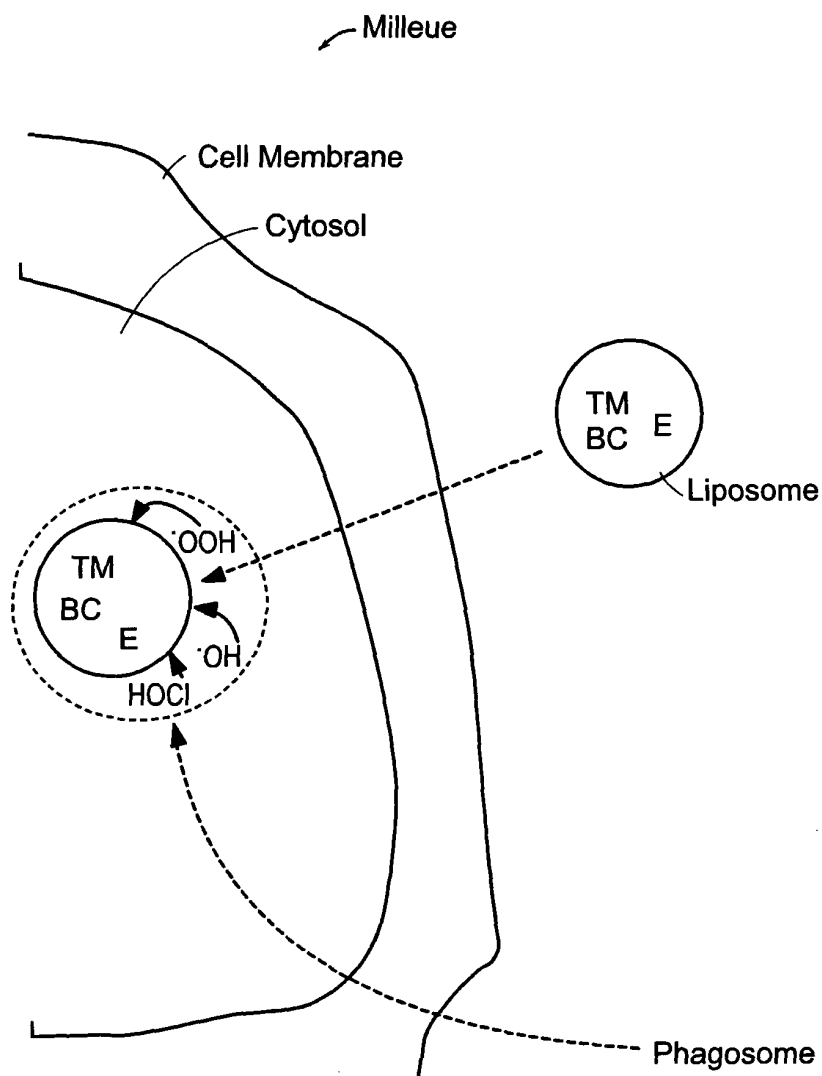
**FIG. 3A**



Oxidants liberated into the microenvironment, and subsequently attacking liposomes.

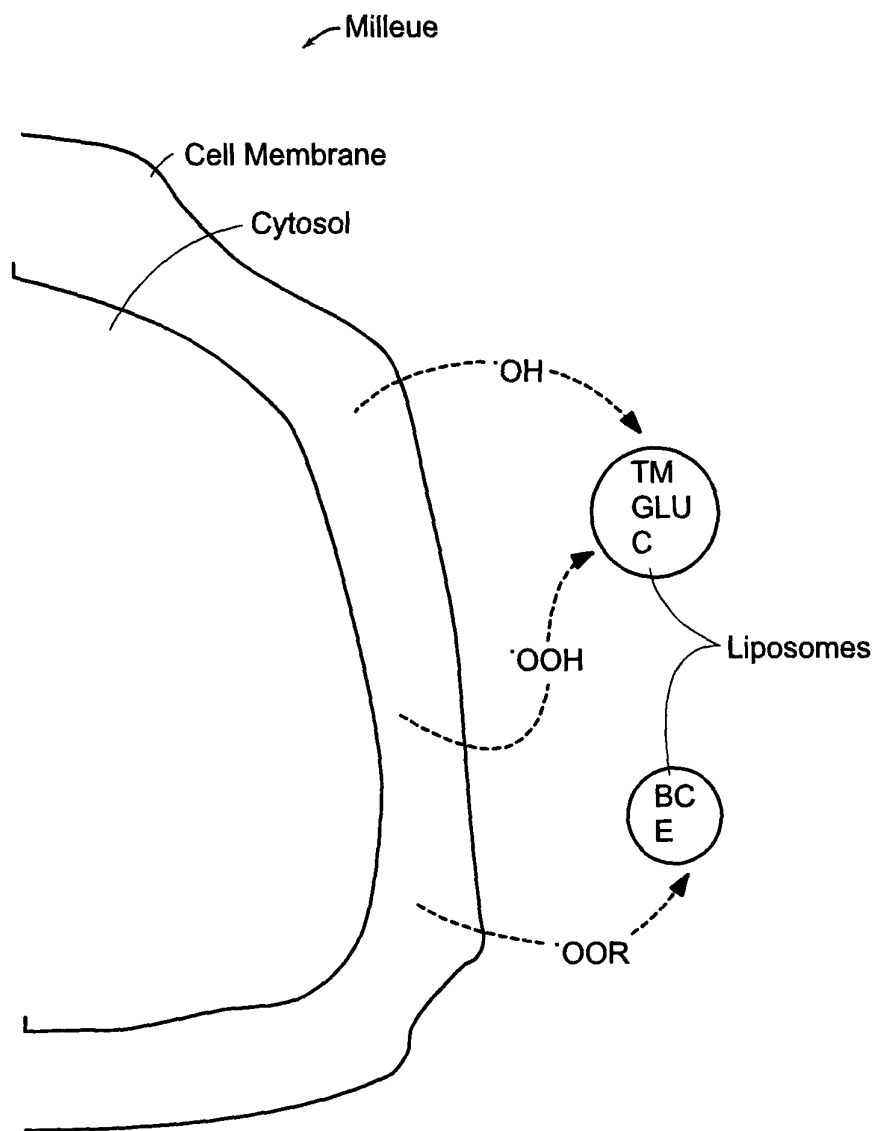
Antioxidants also liberated into the microenvironment, after rupture of liposomes.

**FIG. 3B**



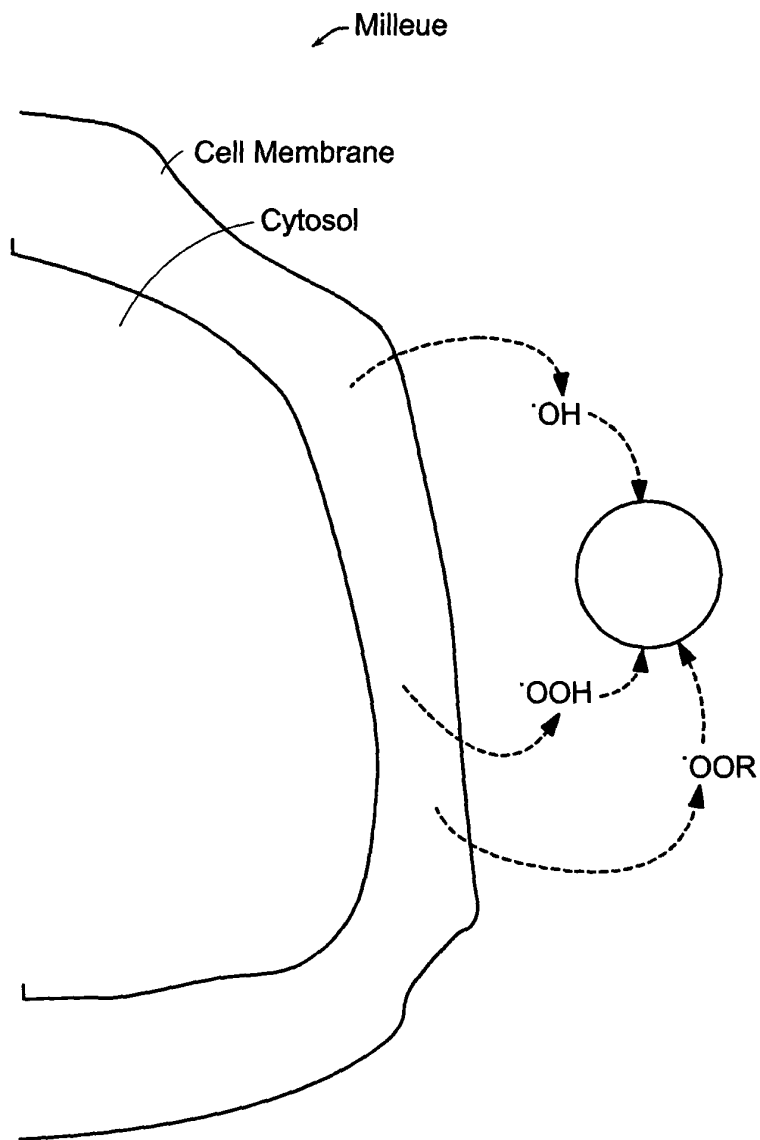
The liposome may undergo peroxidation on entrance through the cell membrane or within the cell itself

FIG. 4



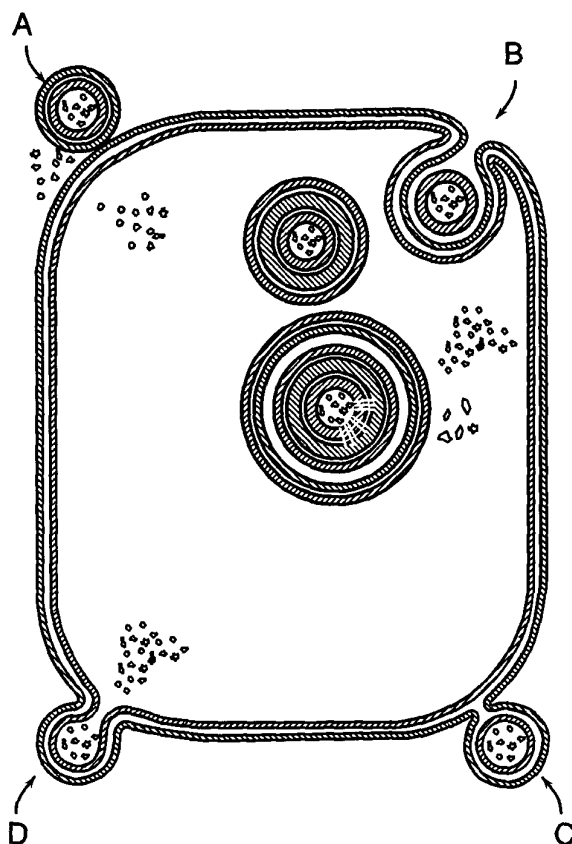
Liposomes in the proximity of a cellular membrane undergoing peroxidation. The liposomes once adjacent to the membrane, would then also undergo peroxidation with release of antioxodants. The anti-oxidants will quench the free radicals and abate futher membrane damage.

FIG. 5



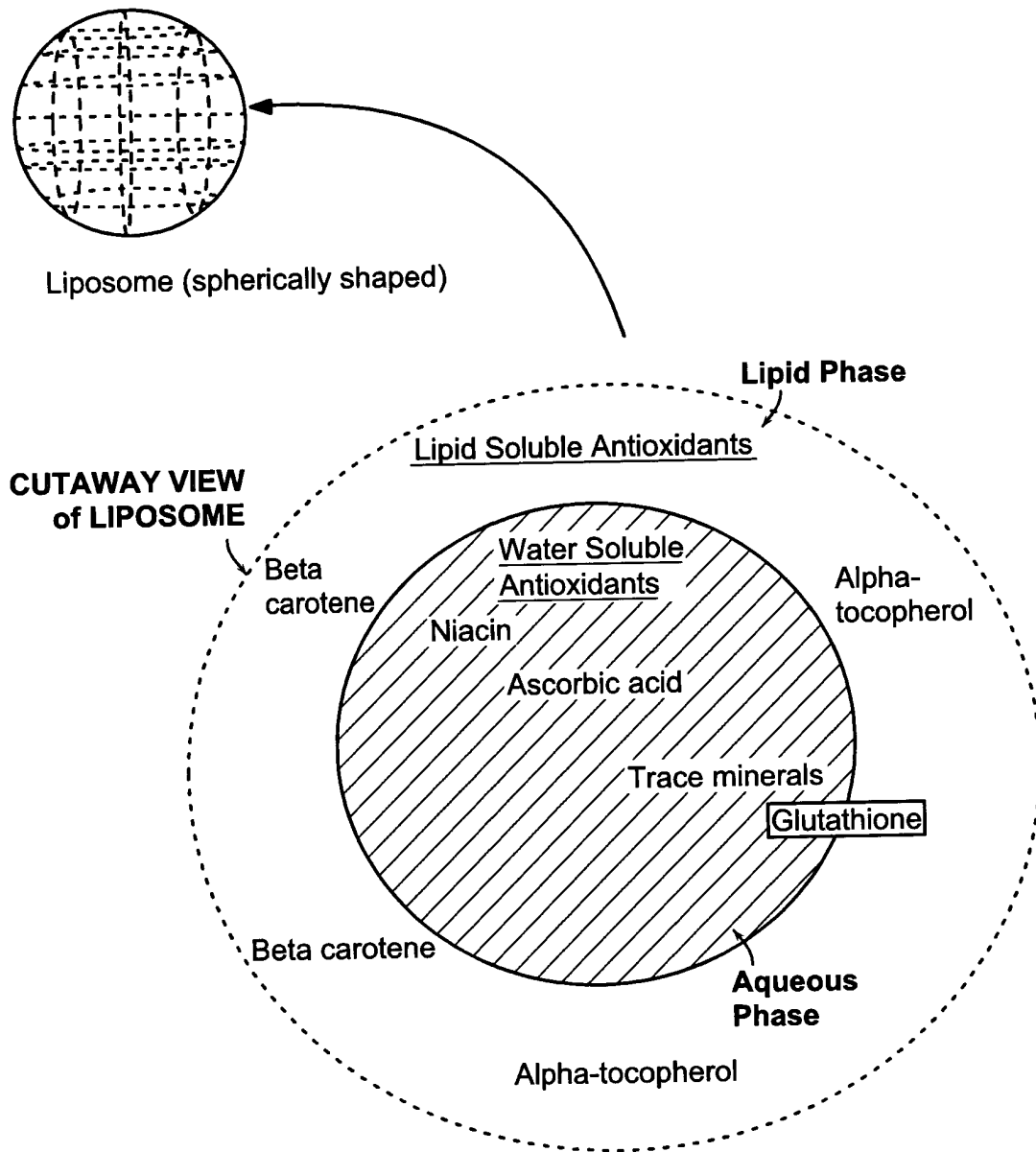
Oxidants occuring within the cell membrane attack the liposomal membrane.  
Oxidants would then be erradicated preventing further tissue damage.

FIG. 6



- A- adsorbed liposome
- B- Liposome undergoing endocytosis
- C- Liposome undergoing lipid exchange
- D- Fused liposome
- E- Cell membrane undergoing peroxidation with subsequent peroxidation of liposomes (not shown, see Fig.6)

FIG. 7



\*\*\*Glutathione exhibits both lipophilic  
 and hydrophilic properties

FIG. 8



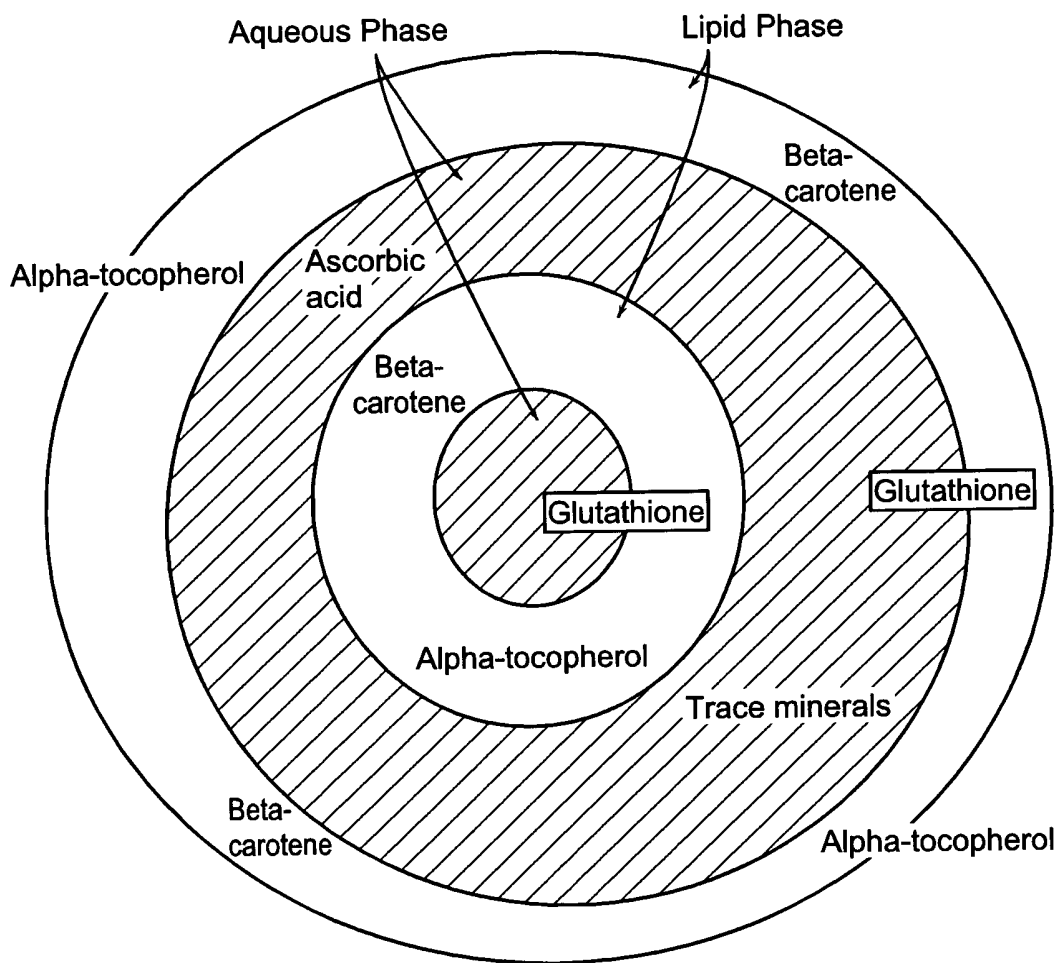
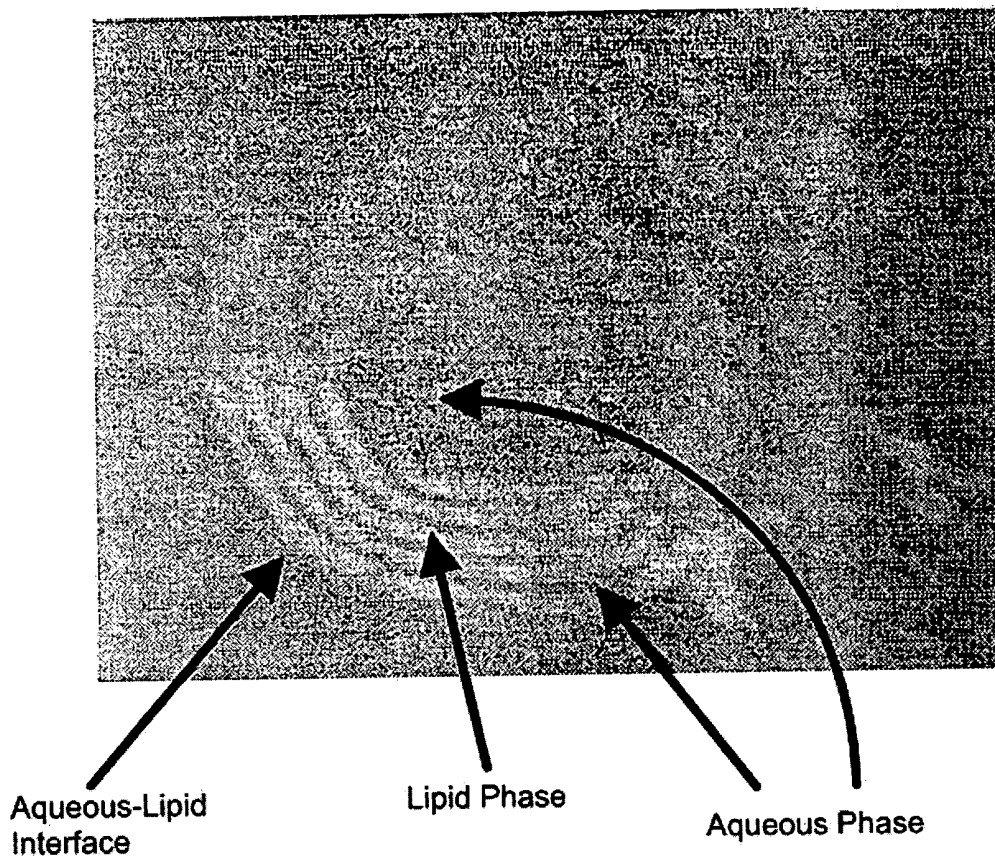


FIG. 9



The dark areas are the aqueous phase, and the light areas are lipid. Lipid soluble antioxidants would be found in the lipid phase and water soluble antioxidants would be found in the aqueous phase.

FIG. 10

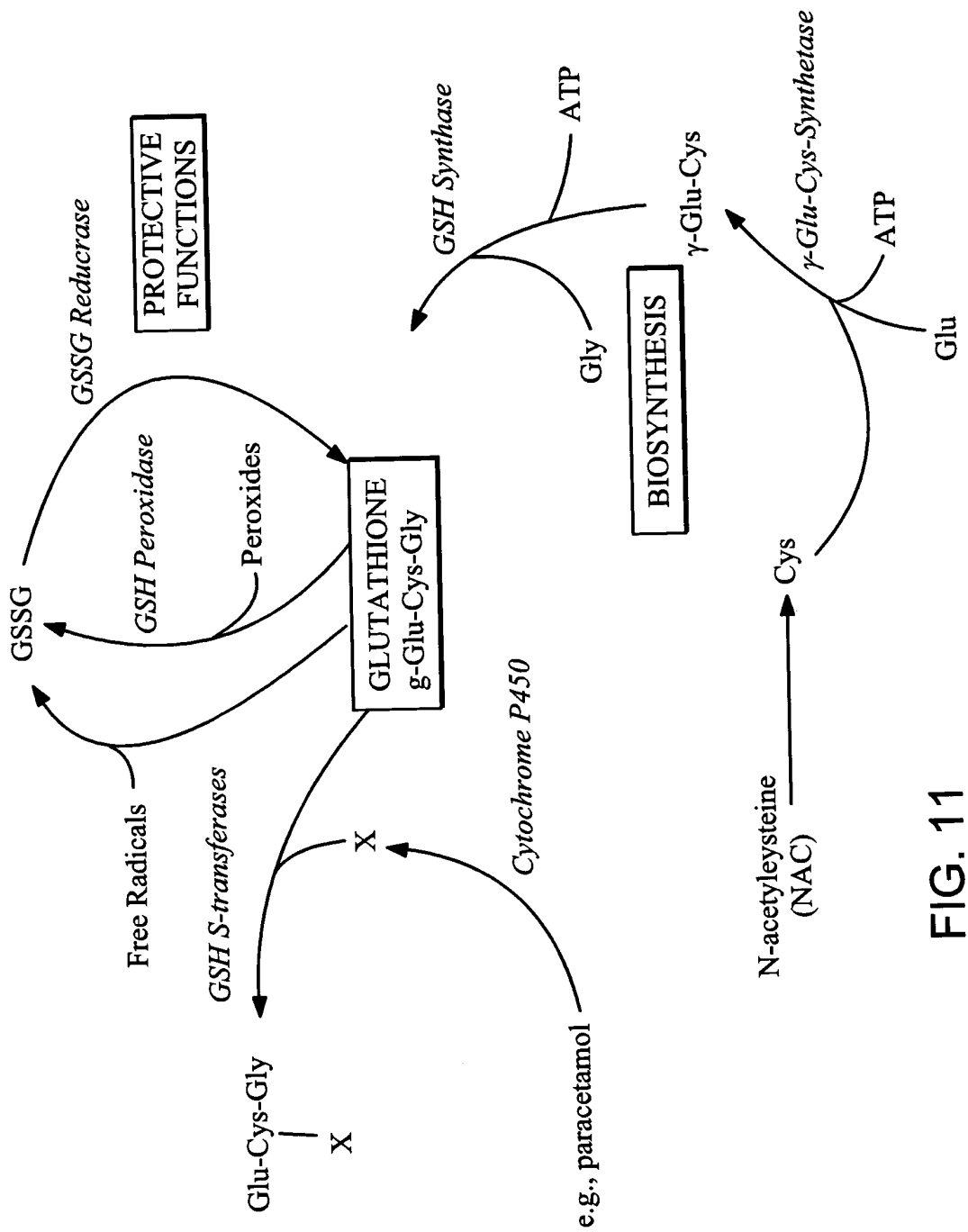


FIG. 11

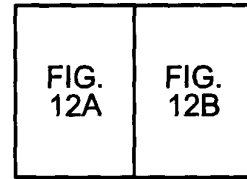


FIG. 12

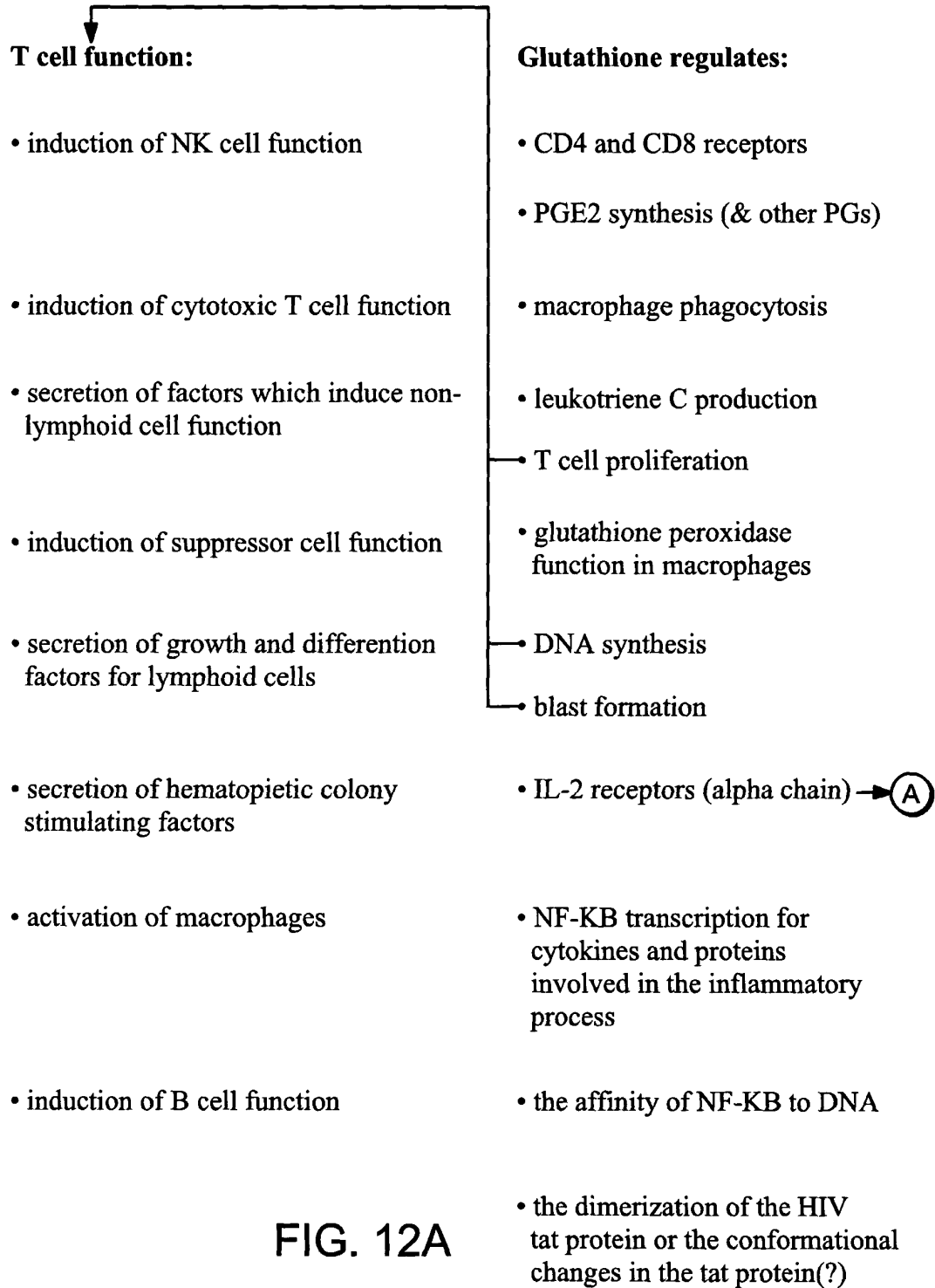
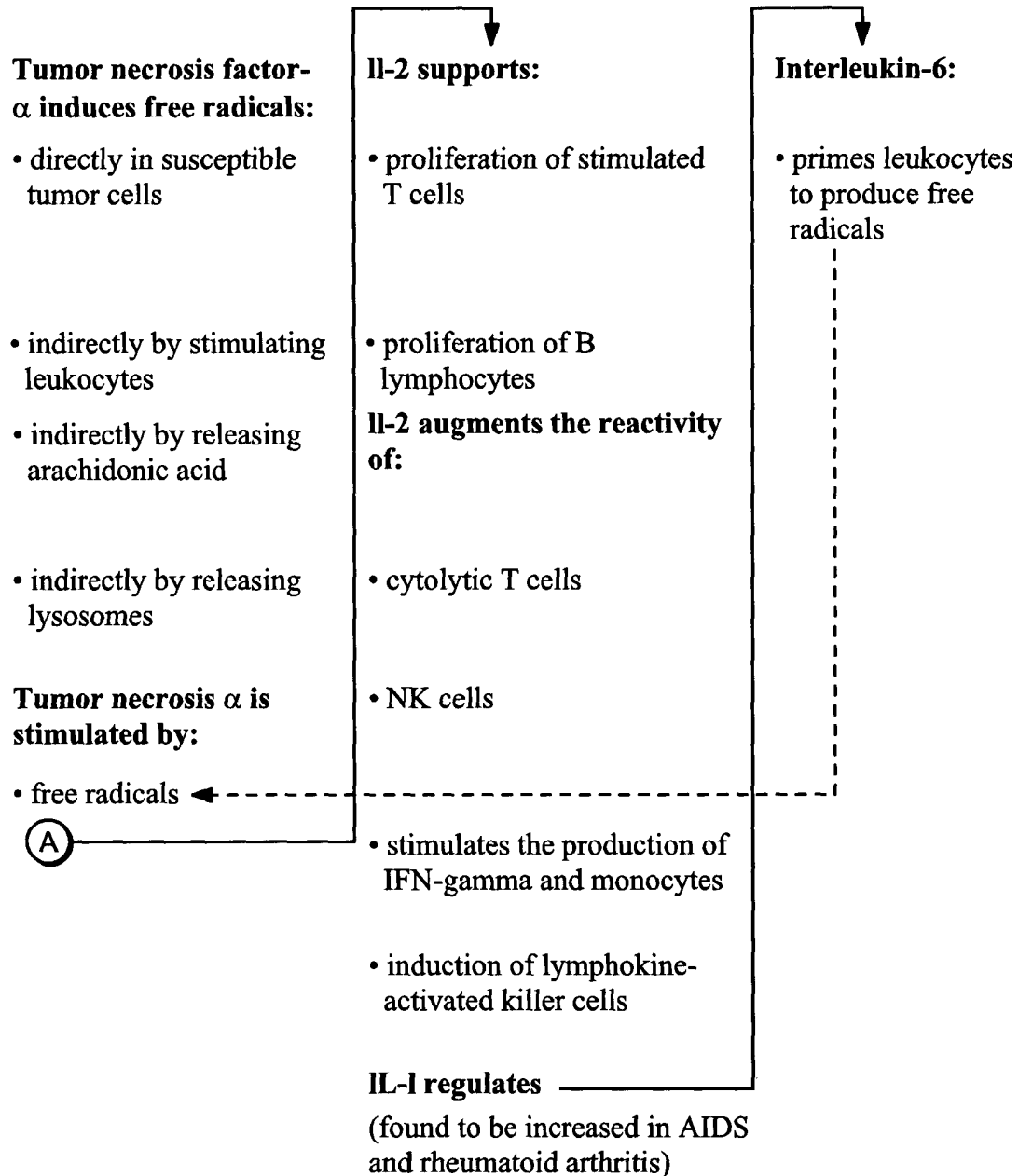
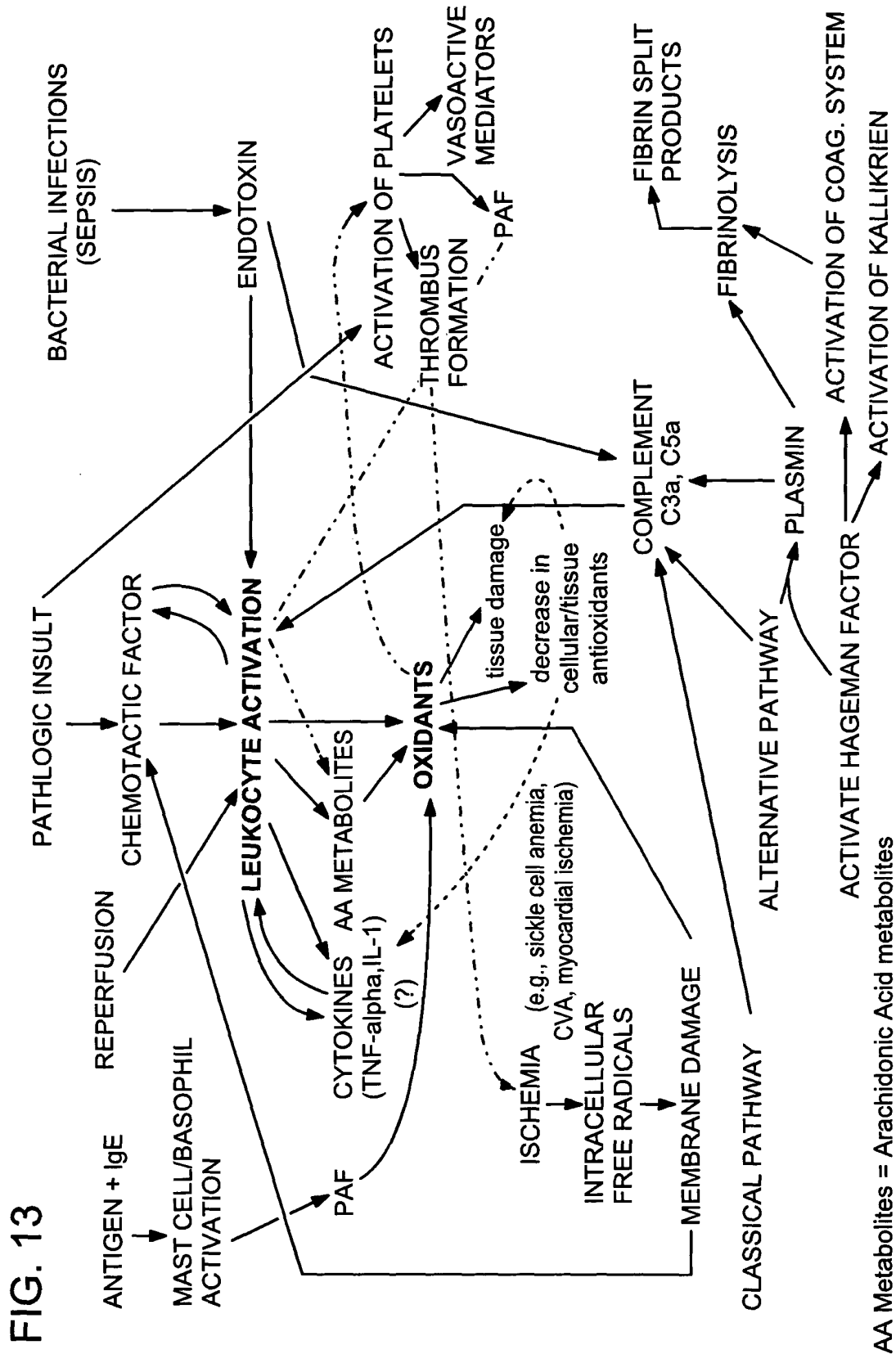


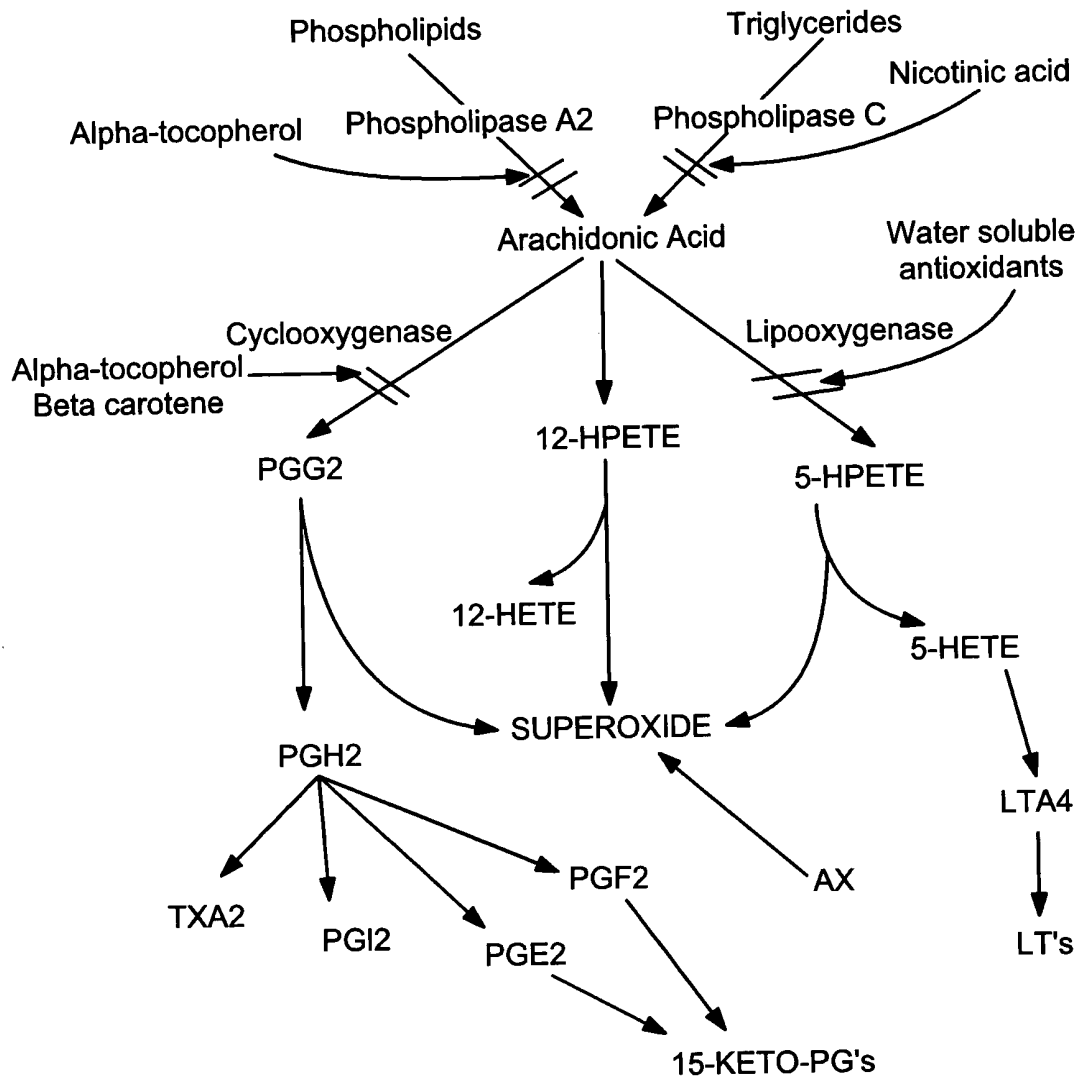
FIG. 12A



Glutathione decreased in AIDS  
 TNF-alpha increased in AIDS, Sepsis, Burns  
 IL-6 increased in AIDS

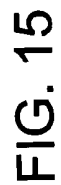
FIG. 12B





AX = antioxidants

FIG. 14





## Prostaglandin Metabolites; Enzymes and Their Inhibitors

### Key to abbreviations:

PGG2 - Prostaglandin G2  
PGH2 - Prostaglandin H2  
TXA2 - Thromboxane A2  
PGI2 - Prostaglandin I2  
PGE2 - Prostaglandin E2  
PGF2 - Prostaglandin F2  
15-Keto-PG's - 15- Keto- Prostaglandins  
12-HPETE - 12- Hydroperoxy eicosatetraenoic acid  
12-HETE - 12- Hydroxyeicosate-traenoic acid  
5-HPETE - 5- Hydroperoxy eicosatetraenoic acid  
5-HETE - 5- Hydroxyeicosate-traenoic acid  
LTA4 - Leukotriene A4  
LT's - Leukotrienes (types B4, C4, D4, E4)

### Enzymes

### Enzyme Inhibitors

Phospholipase A2	Alpha-tocopherol	(fat soluble)
Phospholipase C	Nicotinic acid	(Water soluble)
Cyclooxygenase	Alpha-tocopherol and beta-carotene	(fat soluble)
Lipoxygenase	Glutathione and ascorbic acid	(Water soluble)

FIG. 16

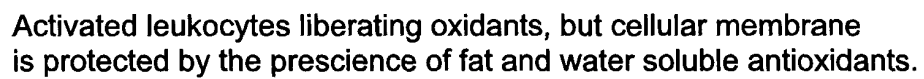


FIG. 17